

**Arrangement for controlling and monitoring a switchgear  
assembly**

5 CLAIM FOR PRIORITY

This application is a national stage of PCT/DE2003/003104, published in the German language on April 8, 2004, which claims priority to German Application No. 102 44 845.0 filed September 20, 2002.

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TECHNICAL FIELD OF THE INVENTION

The invention relates to an arrangement for controlling and monitoring a switchgear assembly.

15 BACKGROUND OF THE INVENTION

Siemens document "SICAM HV - Digitale Leistungsschaltersteuerung" (Digital Breaker Control DBC), Order No. E5001\_U113-A230/1 has disclosed an arrangement for controlling and monitoring a switchgear assembly, of which  
20 one of a plurality of switch panels is illustrated. On an uppermost hierarchical plane, the arrangement has a local control system which is formed by a station control computation device. Via a so-called field bus, there is a communications link between the station control computation  
25 device and a process control device and a protective device; the two latter devices form a central plane in the hierarchy. The two devices need to satisfy the environmental conditions in the switchgear assembly and also conditions for EMC (electromagnetic compatibility).  
30 The known arrangement also has a dedicated process bus for the switch panel shown, and, via this process bus, the process control device is linked to apparatuses for

digitally controlling switches, the switches being isolating/grounding switches and a power breaker. In addition, the process control device is linked, via the process bus, to transformer electronics having digital  
5 outputs, which are usually arranged outside in the switch panel in the vicinity of the switches. The protective device in the known arrangement is connected on the input side directly to the transformer electronics and is linked on the output side to the apparatus for digitally  
10 controlling the power breaker.

#### SUMMARY OF THE INVENTION

The invention discloses an arrangement for controlling and monitoring a switchgear assembly which can be produced with  
15 relatively little complexity.

In one embodiment of the invention, there is an arrangement for controlling and monitoring a switchgear assembly having a station control computation device, in which the  
20 functions of at least one process control device and/or at least one protective device are integrated, and having apparatuses for digitally controlling switches of the switchgear assembly having digital inputs and outputs; in addition the arrangement has transformer electronics,  
25 arranged in the vicinity of the switches, having digital outputs, the digital inputs and outputs of the apparatuses for digital control and the digital outputs of the transformer electronics being logically linked to the station control computation device via arbitrary physical  
30 communications links.

One significant advantage of the arrangement according to the invention is the fact that it manages without a process

control device and without a protective device, since the functions of these devices are transferred to the station control computation device. Hence, no special outlay on these devices which is essentially determined by the fulfillment of the requirements as regards the environmental and EMC conditions. A further, significant advantage consists in the fact that a hierarchical plane, namely that formed by the process control and protective device, is dispensed with, as a result of which a saving of one bus can be achieved. One additional advantage is provided by the fact that, for the station control computation device, a conventional computer may also be used for handling the functions of the process control device and the protective device, and thus specially protected computation modules, as had to be used in previous arrangements for the process control and protective devices, are no longer required.

In another embodiment according to the invention, the station control computation device can be formed in different ways. For example, the station control computation device for each switch panel of the switchgear assembly can in each case have one station control computer, in which the functions of the process control and protective devices, which are associated with the respective switch panel, are integrated. In this embodiment, computers may be used which have a relatively low performance.

If a conventional computer having a relatively high computational power is available, it is advantageous if the station control computation device has, for at least two switch panels of the switchgear assembly, a common station

control computation apparatus, in which the functions of the process control and protective devices, which are associated with the at least two switch panels, are integrated. This makes it possible to further reduce the overall complexity of the arrangement according to the invention.

In still another embodiment according to the invention may, in a simple and cost-optimum manner, be of redundant design by the apparatuses for digital control and the transformer electronics being logically linked to a further station control computation device via further arbitrary physical communications links.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The invention is described below in more detail with reference to the drawings and exemplary embodiments, in which:

Figure 1 shows a station control computation device, formed by a station control computer, for a switchgear assembly having a plurality of switch panels.

#### DETAILED DESCRIPTION OF THE INVENTION

The arrangement 1 shown in Figure 1 for controlling and monitoring a switchgear assembly 2, of which only one switch panel 3 is shown in the figure, has, as the station control computation device, a station control computer 4, which may be a conventional computer, for example a PC. The station control computer 4 is, on the one hand, linked in a conventional manner to a network control computer N, and, on the other hand, is connected to a bus 5 as the physical communications link. Apparatuses 6 and 7 for digital

control having digital inputs and outputs 8 and 9 are  
linked to this bus 5; here, the apparatus 6 is an apparatus  
for digitally controlling an isolating switch 10 in the  
switch panel 3, and the apparatus 7 is an apparatus for  
5 digitally controlling a power breaker 11. In addition,  
transformer electronics 12 are connected with their digital  
output 13 to the bus 5. The transformer electronics 12 have  
a voltage transformer 14 and a current transformer 15  
applied to them on the input side.

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Further switch panels (not illustrated in the figure) of  
the switchgear assembly 2 are linked to the apparatuses 6  
and 7, and transformer electronics, corresponding to the  
transformer electronics 12, are linked to the bus 5.

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In order to increase the functional reliability of the  
arrangement shown in the figure, the bus 5 and also the  
station control computer 4 may be of redundant design by a  
second bus 5a being installed in parallel with the bus 5,  
20 and a second station control computer 4a, which is set up  
correspondingly, being installed in parallel with the  
station control computer 4.